2003 - 2004

Kansas Air Quality Report

Kansas Department of Health & Environment
Bureau of Air and Radiation

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A Message from the Director
of the Division of Environment

Dear Reader:

Each year the Bureau of Air and Radiation prepares a report on the results of air quality monitoring and emissions inventory activities conducted on behalf of the citizens of the State of Kansas. These reports provide information regarding long-term air quality trends and emerging areas of interest. It is one of the ways the Kansas Department of Health and Environment (KDHE) continues to work with the citizens of Kansas to maintain clean air. The report also discusses successes in air quality management, as well as identifying areas that need improvement. KDHE continues to rely on the support and cooperation of citizens, businesses, industry and federal, state and local governments to address these areas of concern.

To maintain clean air across the state, the active involvement of all Kansas citizens is necessary. Whether the activity is performing regular engine maintenance on cars, mowing the yard later in the evening during ozone alert days or car-pooling to work, each person's contribution is essential. Although Kansas' overall air quality continues to be good, continued improvements will have to balance the needs of public health and the environment with the needs of industry. Everyone has a stake in keeping Kansas' air clean, and everyone can contribute to that continued success.

Ronald F. Hammerschmidt, Ph.D.
Director, Division of Environment

Mission Statement

The mission of the Bureau of Air and Radiation is to protect the public health and environment from all types of air pollution.

Foreword

This 2003 - 2004 report is issued by the Kansas Department of Health and Environment, Bureau of Air and Radiation, to inform the citizens of Kansas of current air quality issues throughout the state. The air program in the State of Kansas is a coordinated effort of the Division of Environment and four local air pollution control programs. The Bureau of Air and Radiation works closely with the local agencies to ensure that Kansas is meeting Federal Clean Air Act requirements in accordance with the Federal Environmental Protection Agency guidelines. The Bureau has been designated as the responsible agency to collect the statewide air quality monitoring data needed to determine the status of compliance with the National Ambient Air Quality Standards (NAAQS).

This report presents the results of measurements of pollutant levels in the ambient air, that portion of the atmosphere near ground level and external to buildings or other structures. Legal limitations on pollutant levels allowed to occur in the ambient air, or ambient air quality standards, have been established for six pollutants, each of which is discussed in more detail in this report. The six pollutants, referred to as criteria pollutants, are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2) and particulate matter (PM). Under Section 108 of the Clean Air Act, the Administrator of the U.S. Environmental Protection Agency (EPA) has determined that these six pollutants may reasonably be anticipated to endanger public health and/or welfare and has issued criteria upon which the ambient standards for each have been established.

Two essential components of air quality management in the state are the identification of (1) areas where the ambient air quality standards are being violated and plans are needed to reach attainment, and (2) areas where the ambient standards are being met, but plans are needed to ensure maintenance of acceptable levels of air quality in the face of anticipated population and industrial growth. The end result of this attainment/maintenance analysis process is the development of local and statewide strategies of stationary source permitting, enforcement and transportation/air quality planning. This report presents the data that were EPA reportable in 2003.

This year's report also includes a section on emissions inventory issues and related data. The inventory is a summary of air pollutant emissions across the state during the preceding year.

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October 2004

Ambient Air Monitoring Network

The Kansas air monitoring network has been established to collect ambient air monitoring data for many purposes. The foremost purpose is to collect data to evaluate whether Kansas citizens are exposed to air pollutants in concentrations above the national ambient air quality standards. These standards have been established to protect public health and to provide secondary benefits such as preservation of the environment, structures, crops and scenic vistas at national parks. Data from the monitoring network is used by EPA and KDHE to determine national air pollution trends and is used to determine attainment status for air pollutants. Data generated by the Kansas monitoring network is reported on a quarterly basis to the Air Quality System (AQS), a national database maintained by EPA.

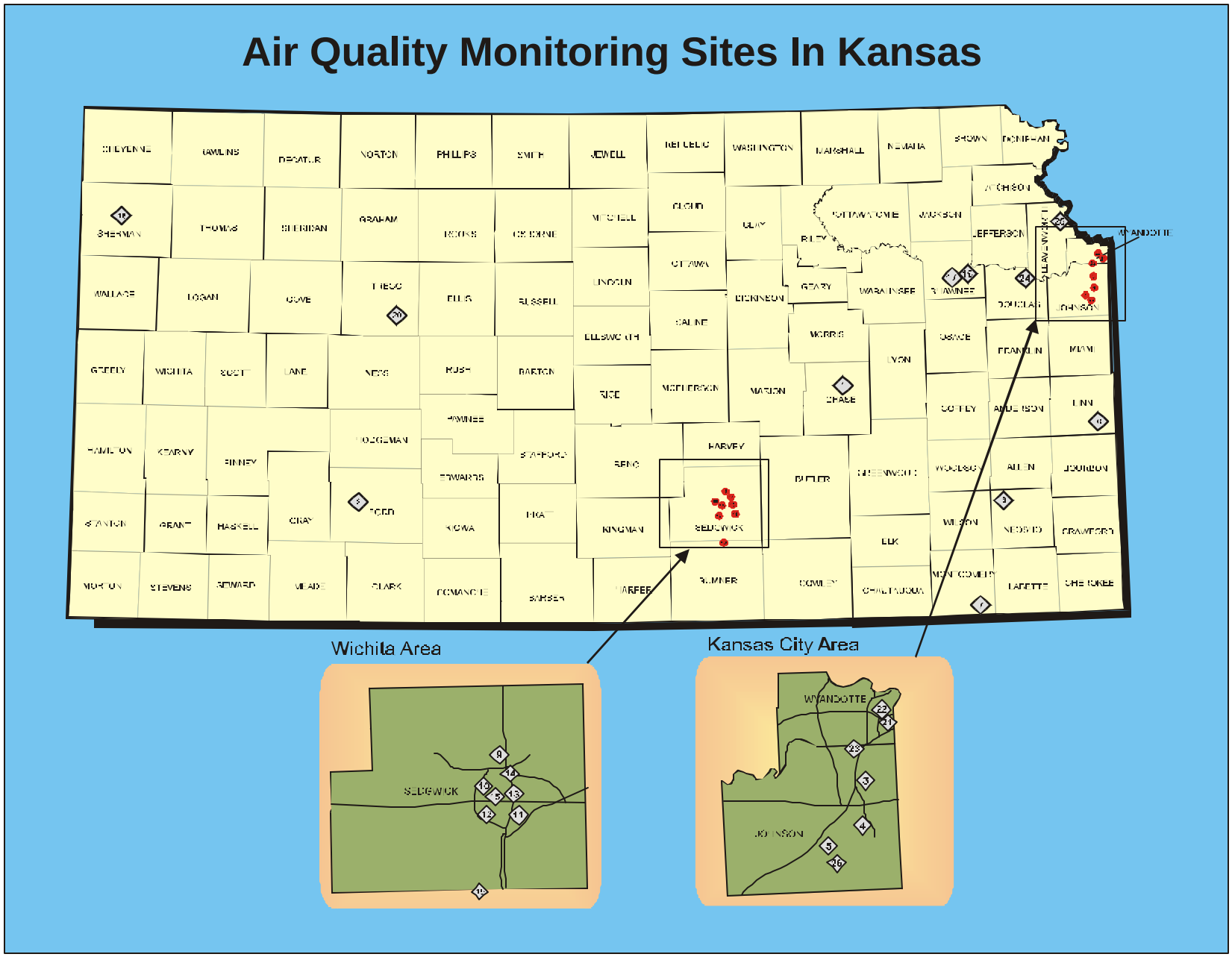
Monitoring data is used for many other purposes, including education of the public through reports such as this, presentations, and the KDHE and local air agency websites. Ozone data is posted on the Bureau of Air and Radiation web page to inform the public about air quality on a real-time basis. This allows persons to make decisions to reduce exposure to air pollution by staying indoors or reducing physical activity. They can also make choices such as riding the bus or avoiding unnecessary trips to reduce emissions of air pollutants. Air quality data is also used to support many other program activities. The data is used to determine whether air quality models are working properly by comparing modeled results against monitored results. For these and many other reasons, a quality air monitoring network is an important part of the overall air program.

The Kansas air quality monitoring network is operated by several different parties. Three local county agencies, Wyandotte, Shawnee and Sedgwick, participate in monitoring activities. The Kansas Department of Wildlife and Parks assists in the operation of the monitor at Cedar Bluff State Park. Private citizens also collect samples at particulate matter monitors in several locations. Finally, BAR staff operate many of the monitors and provide quality assurance audits at all monitors in the network.

For 2003, the Kansas Ambient Air Monitoring Network consisted of 26 sampling sites at which the following criteria pollutants were measured:

- Fine particulate matter ($PM_{2.5}$) at 12 sites
- Coarse particulate matter (PM_{10}) at 12 sites
- Ozone (O_3) at 9 sites
- Meteorological data at 6 sites
- Sulfur dioxide (SO_2) at 5 sites
- Carbon monoxide (CO) at 4 sites
- Nitrogen dioxide (NO_2) at 4 sites
- Fine particle chemical speciation at 3 sites
- Hydrogen sulfide (H_2S) at 1 site
- Total suspended particulate matter (TSP) at 1 site

The type and location of the monitors that comprise the network are a result of our effort to collect data for the many uses described above. A monitor may be located to evaluate air quality near a specific facility or other potential source of air pollution, or it may serve a broader purpose. The majority of monitors are located in metropolitan areas to collect data representative of exposure of large populations to air pollutants. The ozone and $PM_{2.5}$ monitors are examples of such monitoring locations. Our network also includes two monitoring locations designed to evaluate the impacts of long-range transport of air pollutants into and through Kansas. The monitoring sites at Peck (Sumner Co.) and Mine Creek (Linn Co.) serve this purpose. They also provide valuable background data for Wichita and Kansas City respectively. The monitoring site at Cedar Bluff State Park (Trego Co.) is located in an area relatively free of air pollutants caused by industry or transportation sources and therefore serves as a baseline or background site for the entire state.


Air Quality Monitoring Sites In Kansas
Wichita Area
Kansas City Area
SEDGWICK
WYANDOTTE
JOHNSON

Monitoring Site Locations

Site #	AIRS ID	City/Co.	Address	TSP	PM_{10}	CPM_{10}	$PM_{2.5}$	$CPM_{2.5}$	CO	SO_2	O_3	NO_x	Visibility
1	017-0001	Chase Co.	Tallgrass Prairie										IMPROVE
2	057-0001	Dodge City	2100 First		SPM								
3	091-0007	Overland Park	Overland Park Judicial Ctr. 85th & Antioch				SLAMS +Coll.						
4	091-0008	Overland Park	Oxford Middle School				SLAMS						
5	091-0009	Olathe	Black Bob Elem. School				SLAMS						
6	107-0002	Linn Co.	Mine Creek Historic Site				SLAMS (Trans.) +Coll.	SPM	SPM	SPM	SPM	SPM	
7	125-0006	Coffeyville	Union & East North			SPM				SPM +H_2S			
8	133-0002	Chanute	1500 West 7th	SPM	SPM								
9	173-0001	Park City	200 East 53rd North								NAMS		
10	173-0007	Wichita	13th & St. Paul		SLAMS								
11	173-0008	Wichita	G. Washington & Skinner			SLAMS	SLAMS						
12	173-0009	Wichita	Pawnee and Glenn			SLAMS	SLAMS						
13	173-0010	Wichita	1900 East 9th Health Dept.			SPM	SLAMS +Coll.		SLAMS		NAMS	SPM	
14	173-1012	Wichita	3600 N. Hydraulic		Coll.	NAMS							
15	173-1014	Wichita	Douglas & Main							SLAMS			
16	177-0010	Topeka	Robinson Middle School		SPM		SLAMS						
17	177-0011	Topeka	McClure Elem. School				SLAMS						
18	181-0001	Goodland	1010 Center		SPM								
19	191-0002	Peck	Peck Community Building				SLAMS (Trans)			SPM	SPM	SPM	
20	195-0001	Trego Co.	Cedar Bluff Resv.					SPM		SPM	SPM		IMPROVE
21	209-0015	K.C.	420 Kansas		NAMS								
22	209-0021	K.C.	JFK Comm. Center		NAMS +Coll.		SLAMS +Coll.	SPM	SLAMS	NAMS	SLAMS	SPM	
23	209-0022	K.C.	Midland Trail Elem.				SLAMS						
24	045-0004	Lawrence	Lawrence Airport								SLAMS		
25	103-0004	Leaven-worth	Sportsman Field								SLAMS		
26	091-0010	Johnson Co.	Heritage Park								SLAMS		

Coll.: Collocated - similiar monitors placed next to each other to evaluate precision.
SPM: Special Purpose Monitor
CPM_{10}: Continuous PM_{10}
$CPM_{2.5}$: Continuous $PM_{2.5}$

IMPROVE: Interagency Monitoring of Protected Visual Environments
SLAMS: State and Local Air Monitoring Station
NAMS: National Air Monitoring Station
Spec.: Speciation

Kansas Weather

Kansans experience four distinct seasons because of the state's geographical location in the middle of the country. Cold winters and hot, dry summers are the norms for the state. The other constant in Kansas weather is the wind. Kansas ranks high in the nation in average daily wind speed. In 2003, the average wind speed across the state was a little over 11 miles per hour (m.p.h.) The predominant wind direction was from the south. The two wind roses represented in figures 1 and 2 show wind speed and direction from National Weather Service sites in Dodge City and Topeka. Each "petal" of the wind rose shows the predominant direction from which the wind is blowing. These factors combine to affect the two major areas of air quality concern in the state, ozone and particulate matter.

The air pollution meteorology problem is a two-way street. The presence of pollution in the atmosphere may affect the weather and climate. At the same time, the meteorological conditions greatly affect the concentration of pollutants at a particular location, as well as the rate of dispersion of pollutants.

The ground-level ozone or smog problem develops in Kansas during the period from April through October. Ozone is formed readily in the atmosphere by the reaction of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of heat and sunlight, which are most abundant in the summer months. Kansas tends to experience ozone episodes in the summer, especially in the large metropolitan areas, when high pressure systems stagnate over the area which leads to cloudless skies, high temperatures and light winds. Another element of these high pressure systems that contributes to pollution problems is the development

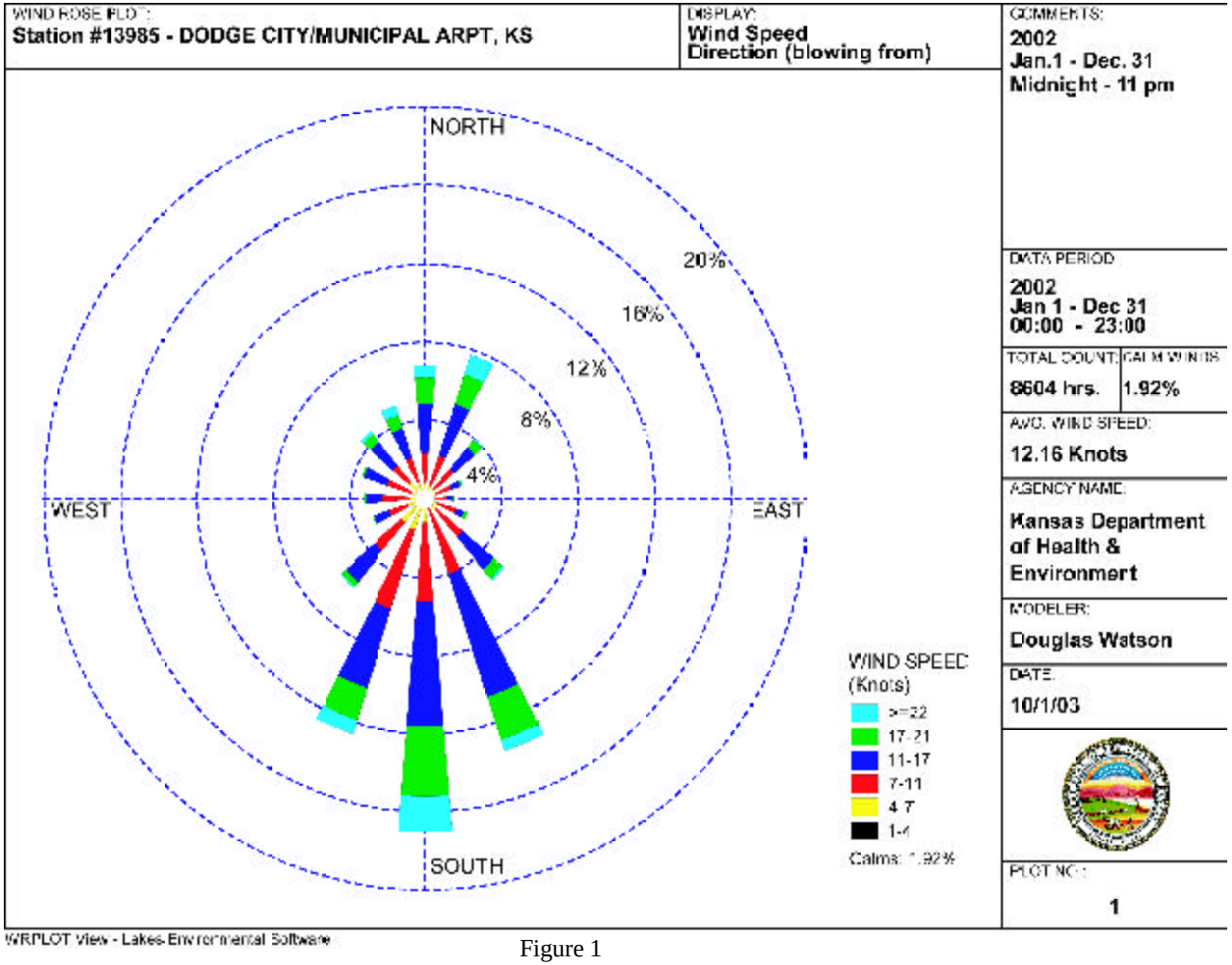


Figure 1

of upper air inversions. This will typically "cap" the atmosphere above the surface and not allow the air to mix and disperse pollutants. Therefore, pollution concentrations may continue to increase near the ground from numerous pollution sources since the air is not mixing within and above the inversion layer.

The other pollutant of concern mentioned earlier is particulate matter. Kansas has a long history of particulate matter problems caused by our weather. The Great Dust Bowl of the 1930s was caused, in part, by many months of minimal rainfall and high winds. This natural source of PM pollution, although not as bad as in the 1930s, is still a concern today as varying weather conditions across the state from year to year cause soil to be carried into the air and create health problems for citizens of Kansas.

The Great Dust Bowl of the 1930s was caused, in part, by many months of minimal rainfall and high winds and caused poor air quality.

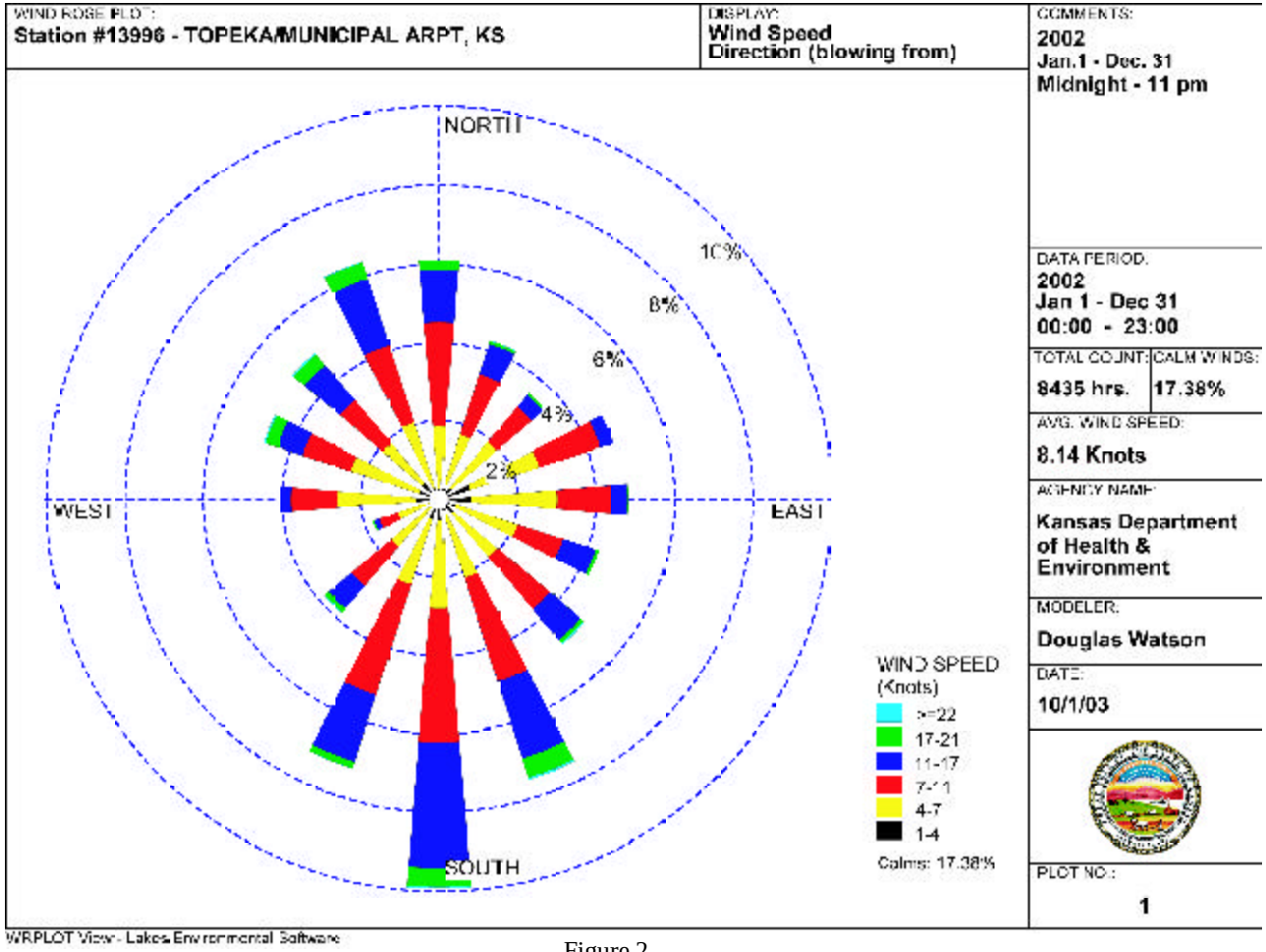


Figure 2

Another source of PM pollution that will be discussed in more detail later in this report is anthropogenic, generated by processes that have been initiated by humans. These particles may be emitted directly by a source or formed in the atmosphere by the transformation of gaseous emissions such as sulfur dioxide (SO_2) and NO_x. Meteorological conditions also affect how these man-made sources of PM form and disperse. One factor that is common in Kansas that can lead to high pollution episodes is a surface inversion. Like upper air inversions, warmer air just above the surface of the earth forms a surface inversion and caps pollutants below it. These inversions are mainly caused by the faster loss of heat from the surface than the air directly above it. In Kansas, surface inversions are more common in the winter months, but can occur during any season and lead to pollution problems.

Standards and Monitoring Results

The Clean Air Act of 1970 required the United States Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for each air pollutant anticipated to endanger public health or welfare. Pollutants in this category, termed criteria pollutants, included: total suspended particulate, lead, sulfur dioxide, carbon monoxide, ozone and nitrogen dioxide.

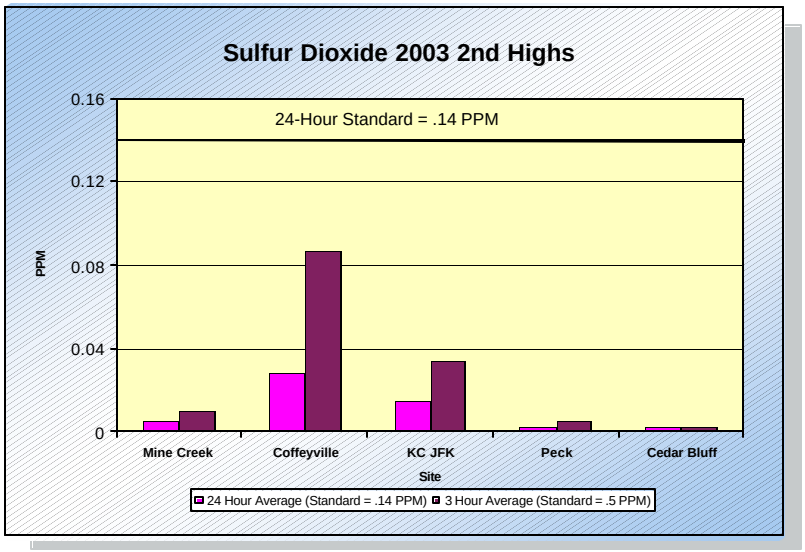
In 1987, total suspended particulate (TSP) was replaced by particulate matter less than 10 microns (1/100 of a millimeter) in diameter (PM_{10}). In July of 1997, both the ozone and particulate matter standards were revised by the EPA. In addition, a new standard for particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$) was introduced. The new standards were challenged in court, which slowed their implementation. In February of 2001, the U. S. Supreme Court ruled in favor of EPA and cleared the way for implementing the new standards.

The current Air Quality Standards are summarized by pollutant in the table on page 20. As shown in the table, there are two types of air quality standards. The primary standard is designed to protect the public health with an adequate safety margin. Permissible levels were chosen to protect the health of the most susceptible individuals in a population, including; children, the elderly and those with chronic respiratory ailments. The secondary standard is designed to protect public welfare and ensure quality of life. Air quality conditions described by the secondary standard may be the same as the primary standard and are chosen to limit economic damage as well as harmful effects to buildings, plants, and animals.

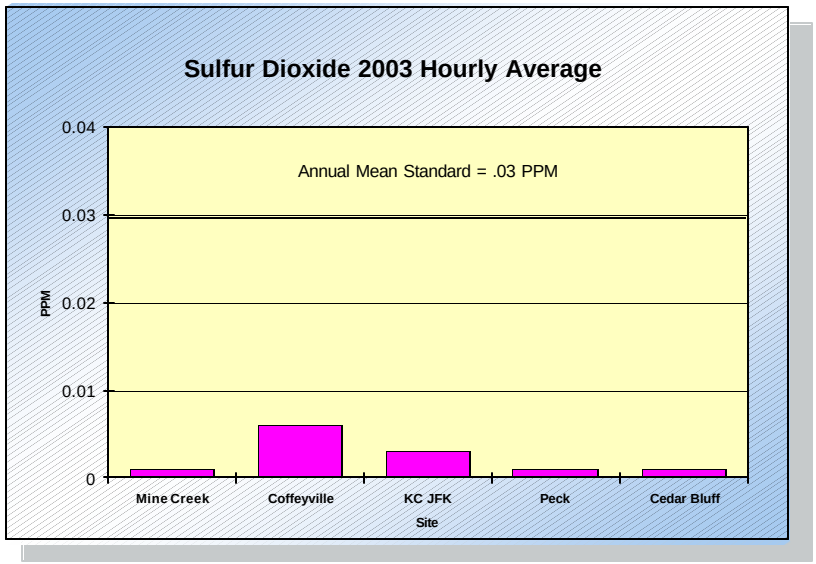
During 2003, the Kansas Ambient Air Monitoring Program monitored for five of the six criteria air pollutants. Monitoring for lead was phased out during 1998, due in large part to the significant drop in measured values caused by the elimination of lead compounds as an additive in gasoline. The following sections will describe each of the five monitored criteria pollutants, their health effects, sources, and the monitoring results.

Sulfur Dioxide

Sulfur dioxide (SO_2) belongs to the family of sulfur oxide gases. Sulfur is prevalent in raw materials such as crude oil, coal and metal ores. Sulfur oxide gases are formed when fuel containing sulfur is burned; when gasoline is extracted from oil; and when metals are extracted from ore. The majority of SO_2 released to the air comes from electric utilities, particularly those that burn coal. Other sources that burn high sulfur fuel and release SO_2 to the air include petroleum refineries, cement manufacturing, metal processing facilities, locomotives, large ships and some offroad diesel equipment. Sulfur dioxide dissolves in water vapor to form sulfuric acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.



Graph 1



Graph 2

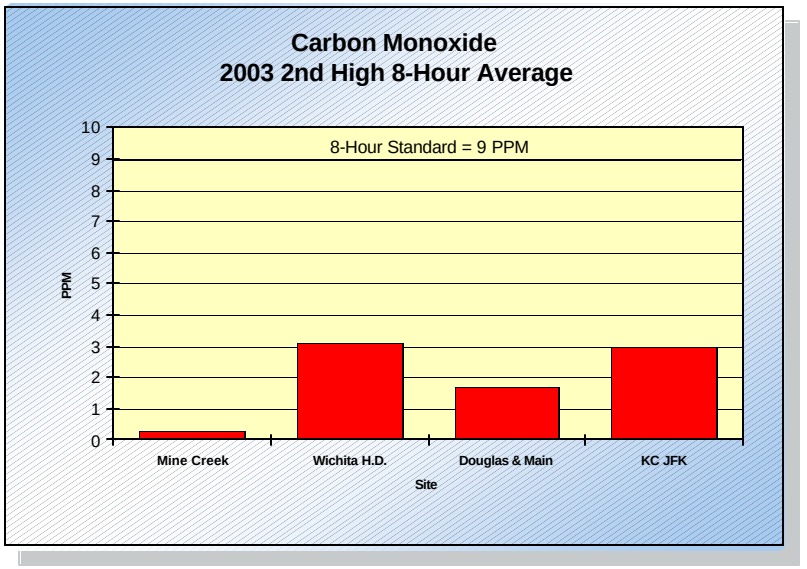
Sulfur dioxide contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases. People with asthma are particularly affected by peak levels of SO_2. It also contributes to the formation of acid rain, which damages trees, crops, historic buildings and monuments; and makes soils, lakes and streams acidic. Sulfur dioxide and sulfate particles can be transported over long distances and deposited far from the point of origin. This means that problems with SO_2 are not confined to areas where it is emitted. It also contributes to the formation of atmospheric particles that cause visibility impairment.

Results:

The primary air quality standard for SO_2 is expressed in three forms: an hourly average value; a 3-hour value not to be exceeded more than once per year; and a 24-hour value not to be exceeded more than once per year. Graph number 1, on page 12, shows the 2nd highest 3-hour and 24-hour average results for the five sites where SO_2 was monitored in Kansas during 2003. Graph number 2 shows the hourly average value concentrations for the five sites where SO_2 was monitored in Kansas during 2003. All of the sites were well below the hourly, 3-hour, and 24-hour standards for SO_2. The Coffeyville and Kansas City JFK sites show the highest concentrations for all forms of the standard due to the proximity of the sites to industrial sources of SO_2.

Carbon Monoxide

Carbon monoxide (CO), is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. Other sources of CO emissions include metals processing, chemical manufacturing, residential wood burning and natural sources



Graph 3

such as forest or prairie fires. The highest levels of CO in outside air typically occur during the colder months of the year when inversion conditions are more frequent. The pollution becomes trapped near the ground beneath a layer of warm air.

Carbon monoxide can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries or congestive heart failure. For such a person, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. Even healthy people can be affected by higher levels of CO. People who breathe high levels of CO can develop vision problems, suffer reduced manual dexterity and experience difficulty performing complex tasks. CO also contributes to the formation of smog, which can trigger serious respiratory problems.

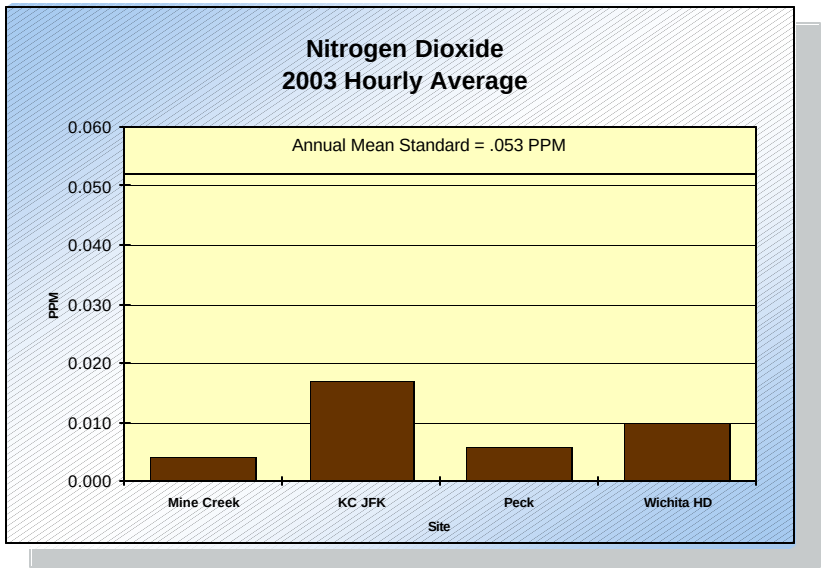
Results:

The primary air quality standard for CO is expressed in two forms: an 8-hour average value; and a 1-hour average value. Both are not to be exceeded more than once per year. Graph number 3, on page 13, shows the 2nd highest 8-hour average concentrations for the five sites where CO was monitored in Kansas during 2003. All of the sites were well below the 8-hour standard. The one hour CO monitoring results ranged from 5 percent to 20 percent of the standard.

Nitrogen Oxides

Nitrogen oxides (NO_x), is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide (NO_2), along with particles in the air can often be seen as a yellowish-brown layer over many urban areas. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO_x are motor vehicles, boilers, furnaces and other industrial, commercial and residential sources that burn fuels.

NO_x is one of the main ingredients involved in the formation of ground-level ozone, which can trigger serious respiratory problems. Most NO_x is emitted to the atmosphere as nitric oxide (NO) which is then converted in the presence of hydrocarbons to nitrogen dioxide (NO_2). The NO_2 created by this reaction is then available to participate in the reaction that forms ozone. Nitrogen oxides also react to form nitrate particles and acid aerosols, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the



Graph 4

pattern of prevailing winds in the U.S. This means that problems associated with NO_x are not confined to areas where it is emitted. Controlling NO_x is often most effective if done from a regional perspective, rather than focusing on sources in one local area.

NO_x and sulfur dioxide react with other substances in the air to form acids which fall to earth as rain, fog, snow or dry particles. Acid rain causes deterioration of car finishes, buildings and historical monuments, and causes lakes and streams to become acidic and unsuitable for many species of fish. NO_x reactions can also cause the formation of small particles that penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease such as emphysema and bronchitis, and aggravate existing heart disease. Nitrate particles and nitrogen dioxide can block the transmission of light, reducing visibility in urban areas and on a regional scale in our national parks and wilderness areas.

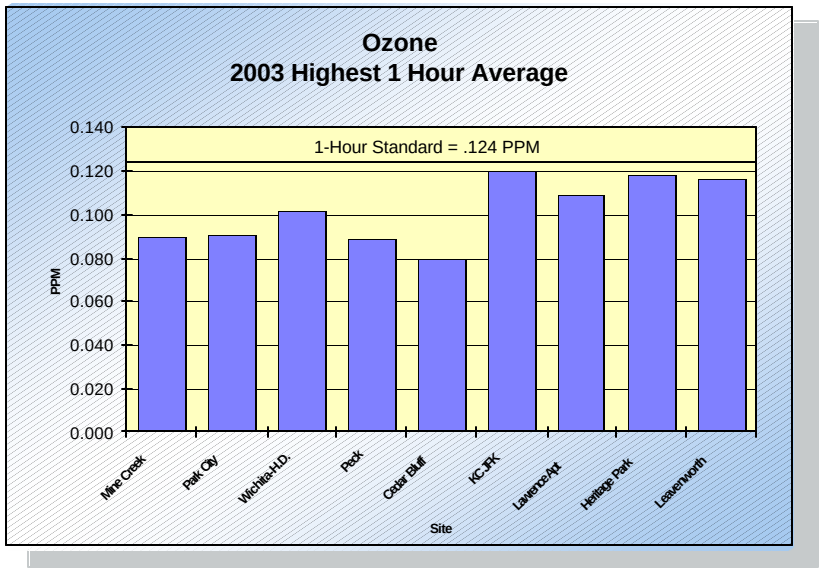
Results:

The primary air quality standard for NO_2 is expressed in the form of an annual arithmetic mean. Graph number 4, on page 14, shows the monitoring results for the three sites where NO_2 was monitored during 2003. All sites were well below the primary air quality standard of 0.053 ppm. The annual average concentration recorded at the Kansas City monitoring site was higher than the Mine Creek and Peck site due to its location in a metropolitan area, where commercial, industrial and motor vehicle emissions are more prevalent.

Ozone

Ozone (O_3) is a gaseous compound composed of three oxygen atoms. It is created by chemical reactions between nitrogen oxides and volatile organic compounds (VOCs) in the presence of heat and sunlight. Formation of ozone is very dependent on meteorological conditions that allow ozone precursors to accumulate in the atmosphere, and sufficient heat and solar radiation to drive the photochemical reaction. Ozone has the same chemical structure whether it occurs miles above the earth or at ground level. “Good” ozone occurs naturally in the stratosphere approximately 10 to 30 miles above the earth’s surface and forms a layer that protects life on earth from the sun’s harmful ultraviolet rays. In the earth’s lower atmosphere, ground-level ozone causes health and environmental problems and is considered “bad.”

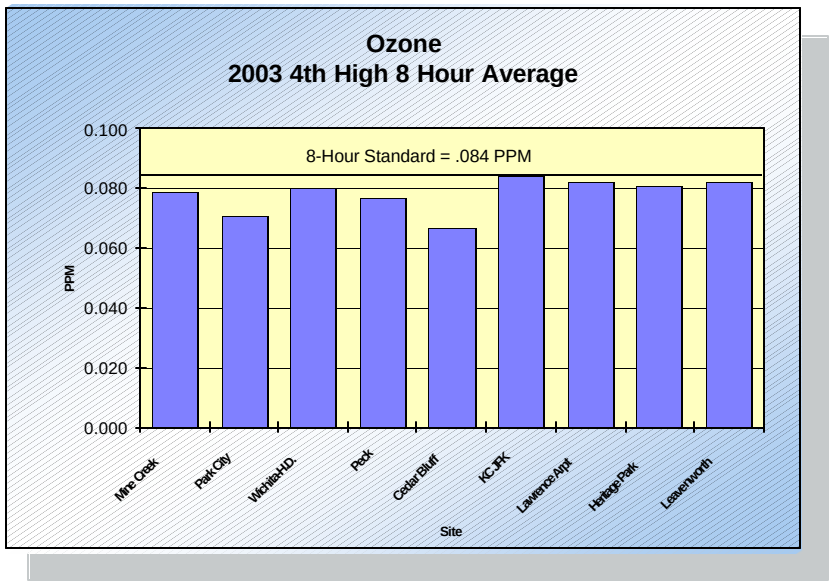
Motor vehicle exhaust, industrial emissions, gasoline vapors and chemical solvents are some of the major sources of NO_x and VOC emissions that help to form ozone. Peak ozone levels typically occur during hot, stagnant summertime conditions. Large urban areas tend to have the highest ozone levels, but even rural areas can experience



Graph 5

increased ozone levels when wind carries ozone and pollutants that form it hundreds of miles from their original sources.

Ground-level ozone triggers a variety of health problems including asthma attacks, reduced lung capacity and increased susceptibility to respiratory illnesses like pneumonia and bronchitis. Ozone can cause permanent lung damage after long-term exposure. Ozone can irritate lung airways and cause inflammation. Other symptoms include wheezing, coughing, pain when taking a deep breath and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable to elevated ozone levels. Ground-level ozone also damages the leaves of trees and other plants, ruining the appearance of parks and recreation areas. Ozone reduces crop and forest yields and increases plant vulnerability to disease, pests and harsh weather.



Graph 6

Results:

The primary air quality standards for ozone are for concentrations averaged over either 8-hour or 1-hour durations. The 8-hour standard is expressed in the form of the three-year average of each year's 4th highest concentration. The 8-hour standard is 0.08 ppm. The standard allows for upward rounding of the results. The standard is not exceeded until monitored values exceed 0.084 ppm. The 1-hour standard is not to be exceeded more than once per year on average over three years. The 1-hour standard is 0.12 ppm. The 1-hour standard also allows for upward rounding. The standard is not exceeded until monitored values exceed 0.124 ppm.

When evaluating ozone monitoring results, it is important to remember two points. First, the rounding allowed by the standard means that a value can be slightly above the standard and not be considered a violation. Second, ozone values higher than the standard for one year do not always indicate a violation of the air quality standard. These determinations are made on the basis of three years of data.

Graph number 5, on page 15, shows the highest 1-hour concentrations for the six sites where ozone was monitored in Kansas during 2003. All of the monitoring sites had 1-hour results that were well below the standard. Graph number 6 shows the 4^{h} highest 8-hour average concentrations for the same six sites. The 8-hour results show that several of the monitors are fairly close to or equal to the standard. Some of the ozone monitoring results will be discussed in greater detail in the sections of this report dedicated to the Kansas City and Wichita metropolitan areas.

Particulate Matter (PM)

Particulate matter (PM) is the term for particles found in the air, including

dust, dirt, soot, smoke and liquid droplets. Some particles are directly emitted into the air from sources such as vehicles, factories, construction sites, tilled fields, unpaved roads, stone crushing and open burning. Other particles may be formed in the air when gases from burning fuels react with sunlight and water vapor. Examples of such formation include fuel combustion in motor vehicles, at power plants and in other industrial processes. Particles can be suspended in the air for long periods of time. Some particles are large or dark enough to be seen as soot or smoke. Others are so small that they can only be detected with an electron microscope.

Particulate matter causes a wide variety of health and environmental impacts. It is associated with serious health effects including: aggravated asthma, respiratory symptoms such as coughing and difficult breathing, chronic bronchitis, decreased lung function and premature death. Elevated PM concentrations result in increased hospital admissions and emergency room visits for people with heart and lung disease. Health problems for sensitive people can get worse if they are exposed to high levels of PM for several days in a row.

Fine particles can be carried over long distances by wind and then settle on the ground or water. The smaller the particle, the greater the potential for aerial transport. This can result in making lakes and streams acidic, damaging forests and farm crops and reducing the diversity of ecosystems. It also causes erosion and staining of structures. Soot, a type of PM, stains and damages stone and other materials, including culturally important objects such as monuments and statues. Particulate matter is the major source of haze that reduces visibility in many parts of the United States, including our national parks and wilderness areas.

PM_{10}

Particulate matter with an aerodynamic diameter of less than or equal to 10 microns is designated as PM_{10}. Burning of wood, diesel and other fuels, and open burning contribute particulate matter to the atmosphere, generally in the form of smoke. Certain industrial processes also generate PM_{10}. In addition, dust from agricultural operations, unpaved roads and dust storms contains a significant proportion of PM_{10}. Some areas within the State of Kansas experience occasional severe episodes of blowing dust or dust storms.

Inhalation of PM_{10} can cause irritation of the nose and throat, bronchitis and damage to lung tissue. Children, elderly persons and individuals with impaired lung or heart function are especially susceptible to the adverse health effects associated with inhalation of airborne particulate matter.

During the “Dust Bowl Days” of the 1930s, dust clouds originating in Kansas and neighboring states were observed on the East Coast of the United States. During the first calendar quarter of 1996, high winds coupled with extremely dry soil conditions caused exceedances of the air quality standard for PM_{10} in Morton and Sedgwick counties.

Results:

The 13-year trend for PM_{10} monitored at the PM site at 3600 N. Hydraulic in Wichita shows that the annual average values have been stable to moderately declining over the thirteen-year period and well below the annual standard of 50 ug/m^3. The year 1996 shows a high 24-hour PM_{10} value due to extremely dry weather and high winds at that time but the other years remain well below the 24-hour standard.

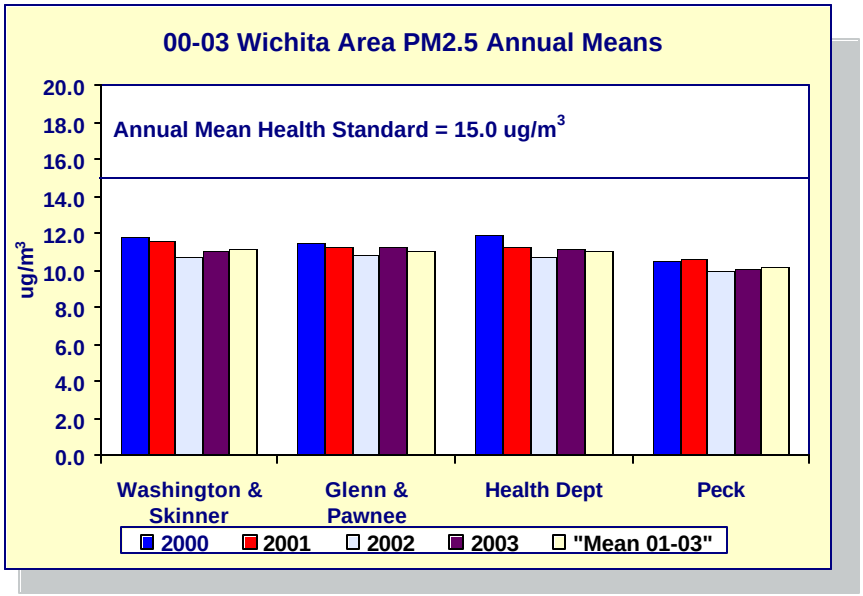
The 13-year trend for PM_{10} at 444 Kindelberger in Kansas City also shows that the annual average values have been stable to moderately declining over the thirteen-year period at this site. These values are well below the annual standard. The year 1996 also shows an increase in PM values

but they are not as pronounced as the values recorded at the Wichita site. Wind speeds and drought conditions were not as extreme in the Kansas City area.

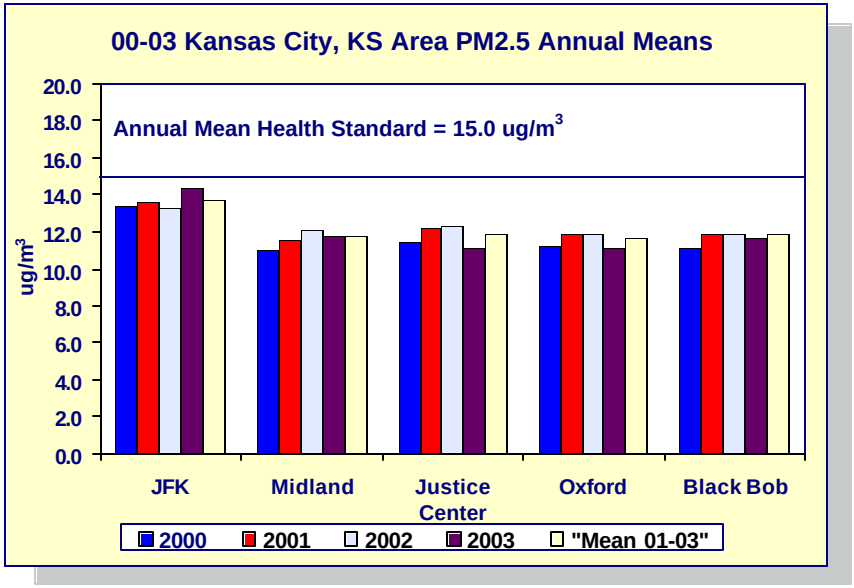
$PM_{2.5}$

Particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$) was added as a new air pollutant in 1997. This change was based on concerns that smaller particles travel deep into the lungs and cause or aggravate respiratory problems such as asthma and chronic bronchitis. Children, the elderly and people with lung or heart disease are considered to be especially susceptible to the adverse health effects of airborne fine particulate matter.

Fine particles ($PM_{2.5}$) result from fuel combustion in motor vehicles, power generation and industrial facilities, as well as from residential fireplaces and wood stoves. Research has shown that gases such as sulfur oxide and SO_2, NO_x and VOCs interact with other compounds in the air to form fine particles.



Graph 7

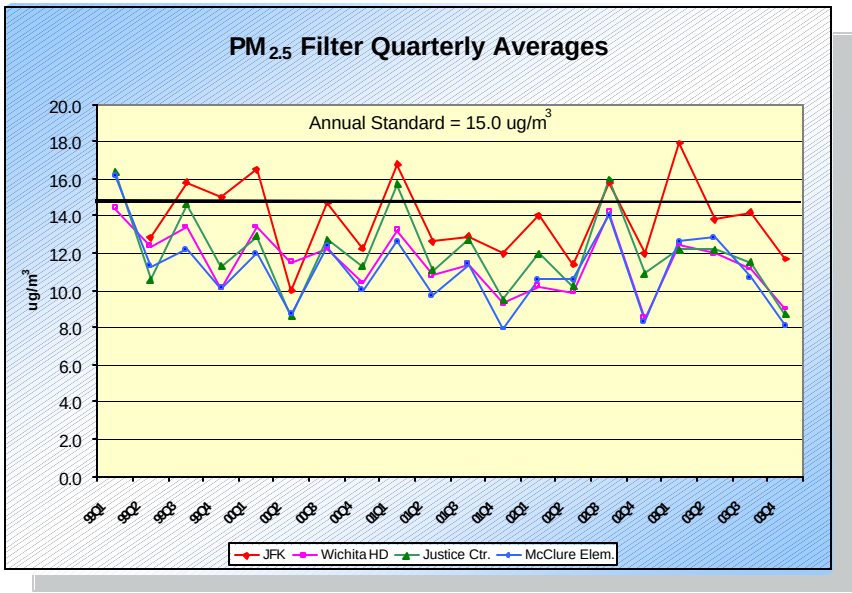


Graph 8

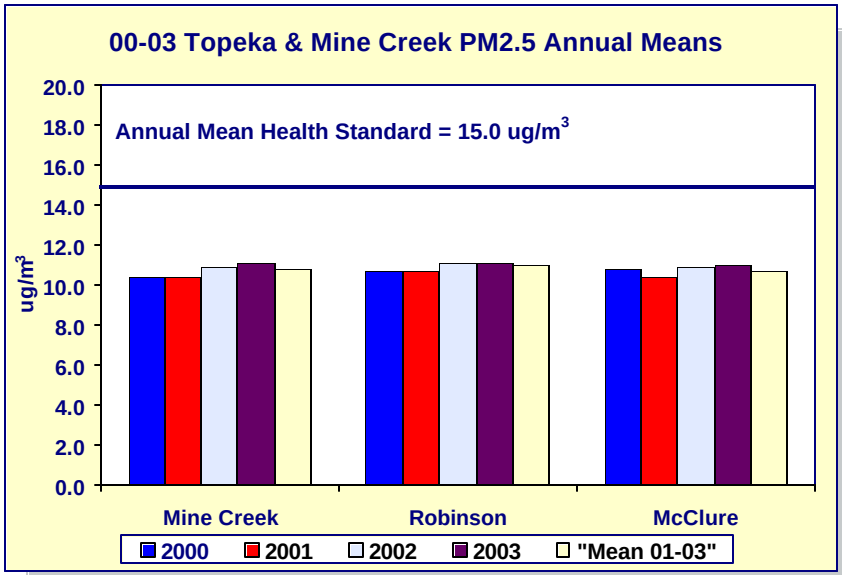
Results:

The $PM_{2.5}$ standard includes two time periods, an annual average and a 24-hour average. The annual average standard was set at 15.0 micrograms per cubic meter (ug/m^3), while the 24-hour average standard was set at 65 ug/m^3. Eleven of the twelve $PM_{2.5}$ monitoring sites across the state have completed over four years of data gathering. Monitoring for $PM_{2.5}$ in Kansas started in 1999. All sites across the state have met the $PM_{2.5}$ standards over this four year period. Graph number 7 shows the four monitors in the Wichita area. For reference and to determine the exact location of all the $PM_{2.5}$ sites across the state, refer back to the the map and table on pages 8 and 9 of this report. All sites are well

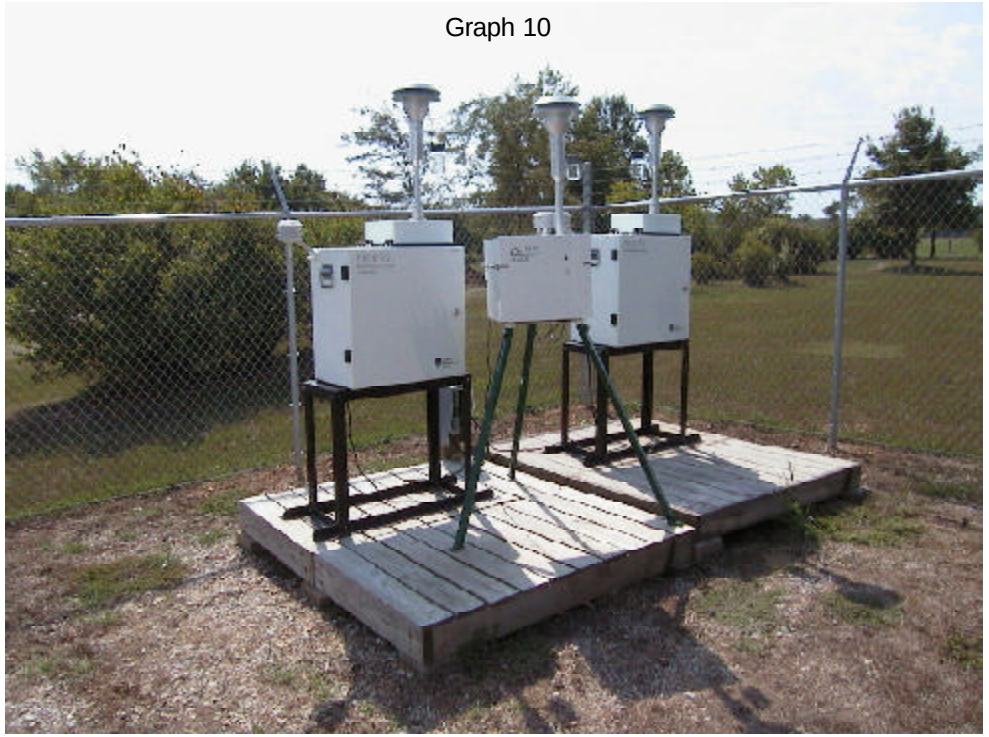
below the annual mean of 15.0 ug/m^3. Graph number 8, on page 18, represents the annual mean values for the Kansas City metropolitan area. The JFK site at 1210 North 10th Street in Kansas City, Kansas, continues to show higher readings than the other Kansas City sites, but still remains below the standard. Graph number nine shows the two monitors in Topeka and the monitor located at the Mine Creek Battlefield area in Linn County. These three sites also continue to show consistent readings over the four year period and are well below the standard of 15 ug/m^3. Graph number 10 shows a quarterly average for four sites across the state. This graph illustrates the seasonal variability of $PM_{2.5}$. The monitors show consistently higher readings in the 1st and 3rd quarters of each year. This seasonality and its causes are still being investigated. Data from chemical speciation monitors, which allow the study of the chemical makeup of $PM_{2.5}$, are being used to develop an understanding of $PM_{2.5}$ in Kansas.



Graph 10



Graph 9



National Ambient Air Quality Standards

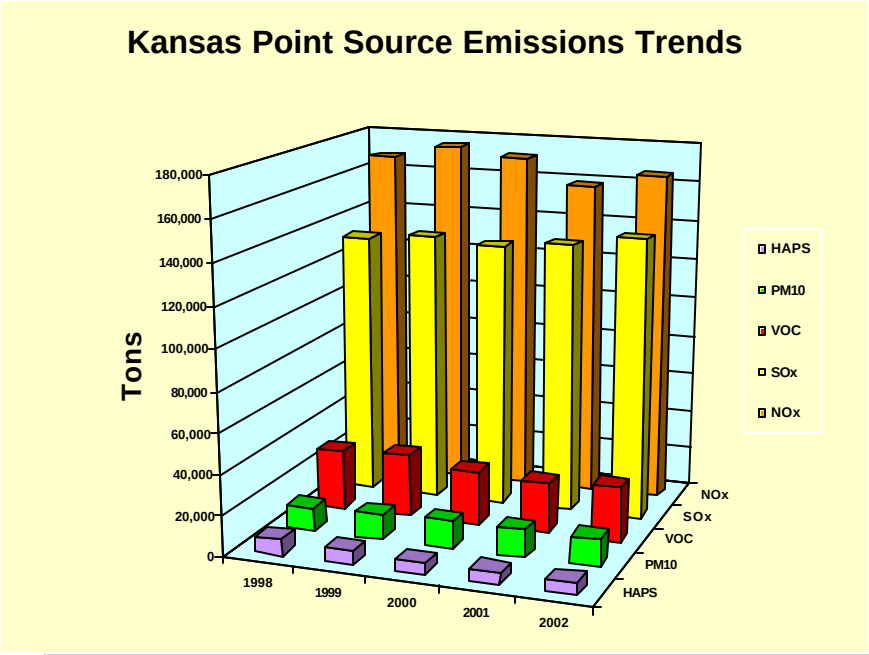
Criteria Air Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon Monoxide	One-hour maximum[a]	35 ppm[c] (40 mg/m^3[b])	None
	Eight-hour maximum[a]	9 ppm (10 mg/m^3)	None
Lead	Quarterly Average	1.5 ug/m^3[d]	Same as Primary Standard
Nitrogen Dioxide	Annual Arithmetic Mean	0.053 ppm (100 ug/m^3)	Same as Primary Standard
Ozone	One-hour average[a]	0.12 ppm (235 ug/m^3)	Same as Primary Standard
	Eight-hour average[e]	0.08 ppm (157 ug/m^3)	Same as Primary Standard
Particulate Matter (PM_{10})	Annual Arithmetic Mean 24-hour average[f]	50 ug/m^3 150 ug/m^3	Same as Primary Standard
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean[g] 24-hour average[h]	15 ug/m^3 65 ug/m^3	Same as Primary Standard
Sulfur Dioxide	24-hour maximum[a]	0.14 ppm (365 ug/m^3)	----------
	Annual Arithmetic Mean	0.03 ppm (80 ug/m^3)	----------
	Three-hour Maximum[a]	----------	0.5 ppm (1300 ug/m^3)

[a] Not to be exceeded more than once a year for primary and secondary standards
[b] mg/m^3 = milligrams per cubic meter
[c] ppm = parts per million
[d] ug/m^3 = micrograms per cubic meter
[e] Established for a three-year average of the fourth highest daily maximum concentration
[f] Established for a three-year average of the 99th percentile of data
[g] Established for a three-year average
[h] Established for a three-year average of the 98th percentile of data

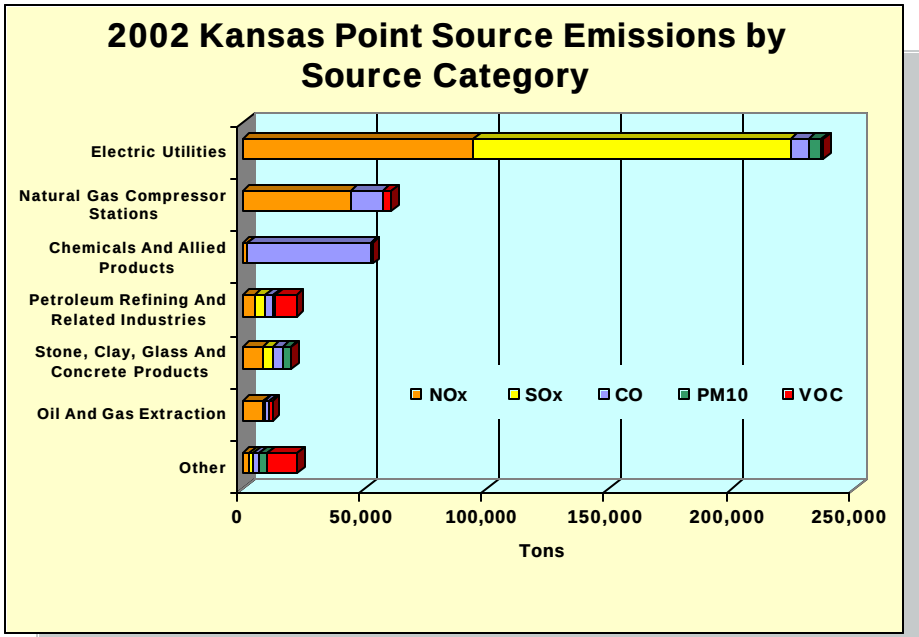
Emissions Inventory

An emissions inventory is a summary of air pollutant emissions covering a geographic area for a specific time period. Emissions inventories have multiple uses on both the federal and state levels. The Bureau of Air and Radiation uses emissions inventory information in the following ways:

- To determine trends in air pollutant emissions levels;
- To provide inputs to air quality modeling;
- To design air pollution control policies and assess their effectiveness after they have been implemented;
- To site ambient air monitors; and
- To determine emissions fees.



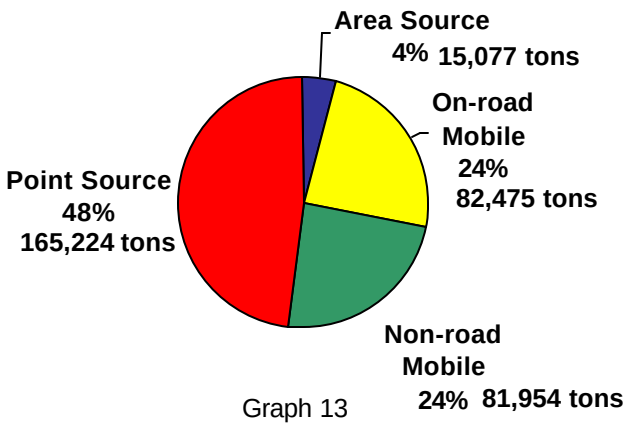
Graph 11



Graph 12

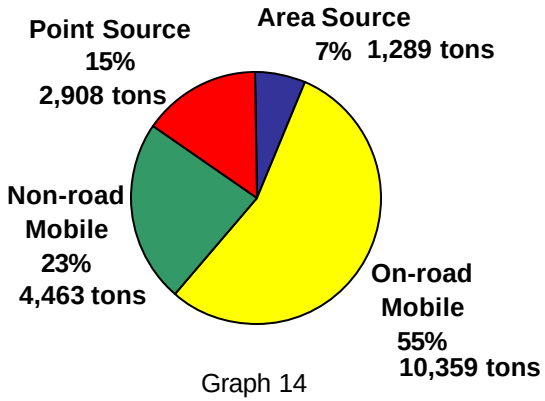
A comprehensive emissions inventory includes emissions from point, area, mobile and natural sources. **Point sources** are large, stationary sources of emissions. In Kansas, point sources are defined as facilities that meet certain emissions thresholds and are required to obtain a Class I or Class II operating permit. Examples of point sources are natural gas compressor stations, petroleum refineries and grain processing or storage facilities. **Area sources** are smaller, generally more numerous sources whose individual emissions do not qualify them as point sources and, therefore, are not subject to permitting requirements. Although area sources release relatively small amounts of air pollutants on an individual basis, because of the numbers of these sources, their emissions as a whole can be significant. Examples include household solvents and paints, motor vehicle refueling and residential fuel combustion. **Mobile sources**, which are sources

State-wide NO_x



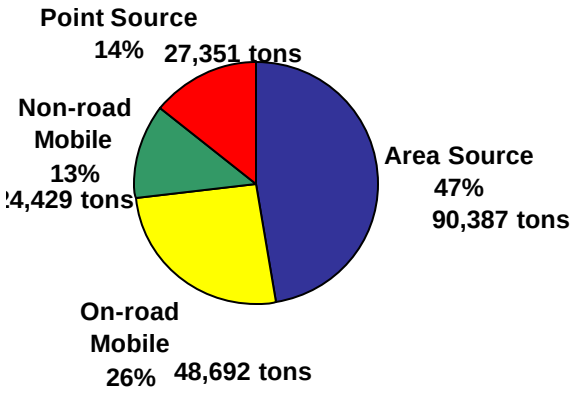
Graph 13

Sedgwick Co. NO_x



Graph 14

State-wide VOC



Graph 15

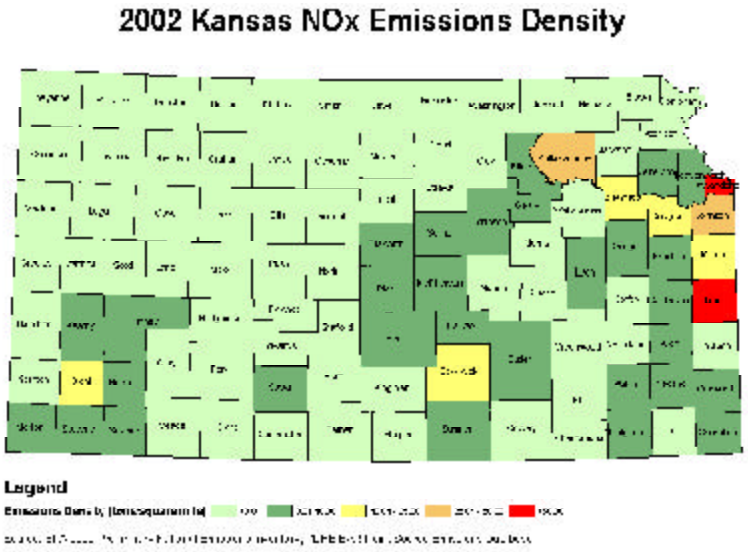
of air pollution that are not stationary, are divided into two categories: *onroad*, which includes cars, trucks, buses and motorcycles, and *offroad*, which includes lawnmowers, locomotives and tractors. Finally, **biogenic and geogenic** emissions are those resulting from **natural sources**, such as forests, agricultural crops and soil erosion. The pie charts on the left show the percent contributions of point, area, and mobile sources to NO_x and VOC emissions in Kansas.

Point Source Emissions Inventory and Fee Program

Every year the Bureau of Air and Radiation prepares an emissions inventory of SO_2, CO, NO_x, VOC, PM_{10} and hazardous air pollutants from point sources in Kansas. The Bureau mails inventory forms to facilities with Class I and Class II permits requesting information regarding operating rates and the quantities and types of air pollutants emitted during the preceding calendar year. After the facilities complete the forms and submit them to the Bureau, the information is reviewed for quality assurance purposes, entered into a large database and forwarded to the EPA.

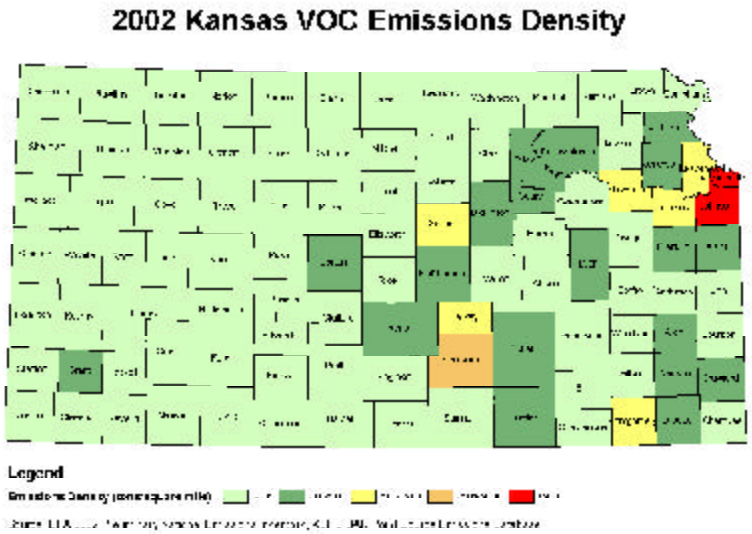
The Bureau has completed the Kansas point source emissions inventory for calendar year 2002. Graph 11, on page 21, illustrates the total reported emissions in tons from 1998 through 2002. Graph 12, on page 21, shows a breakdown of Kansas point source emissions by source category. As can be seen, electric utilities far out distance other sources in total emissions . Graphs 13, 14 and 15 show 2002 NO_x and VOC emissions by source type. The NO_x graphs show the distinct difference in the makeup of the NO_x emissions between the state-wide breakdown and that of the metropolitan areas. Mobile sources tend to drive the metropolitan areas' NO_x emissions. The state-wide VOC graph shows that area sources make up nearly 50% of the emissions, with mobile sources

making up approximately 26%. Maps 1and 2 show Kansas 2002 point source emissions density of NO_x and VOCs by county. Map 3 shows Kansas 2002 Hazardous Air Pollutants (HAPs) emissions density by county. Additional summaries of Kansas point source emissions may be found on the Bureau's emissions inventory

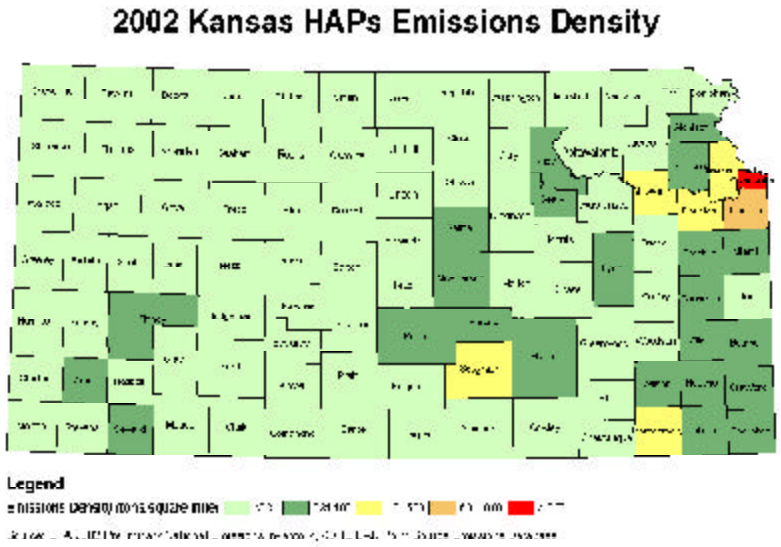


Map 1

website at http://www.kdhe.state.ks.us/bar/emission/index.html. In conjunction with the annual emissions inventory, the Bureau collects emissions fees from point sources with Class I operating permits to help support air program activities and provide services to the public and regulated community. The fee for calendar year 2002 emissions was twenty dollars per ton and was raised to twenty-five dollars per ton for calendar year 2003.



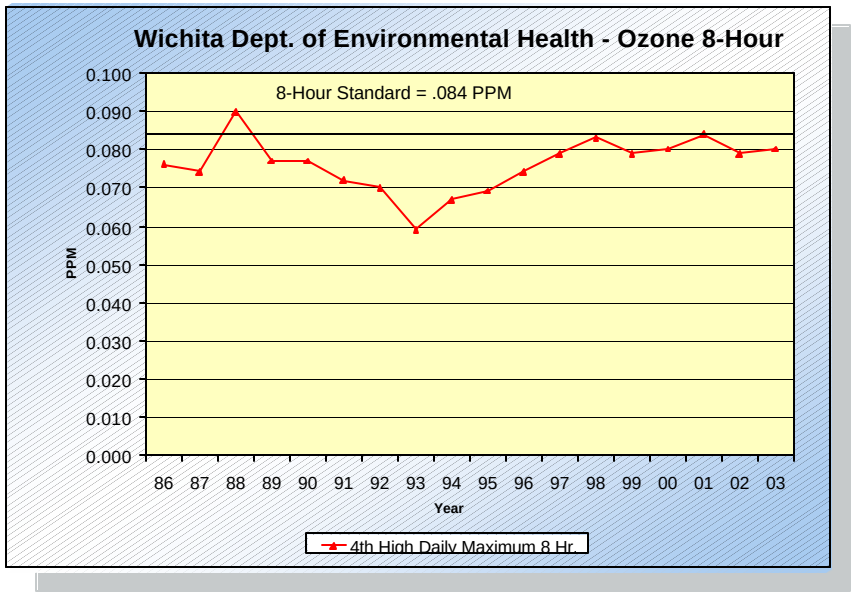
Map 2



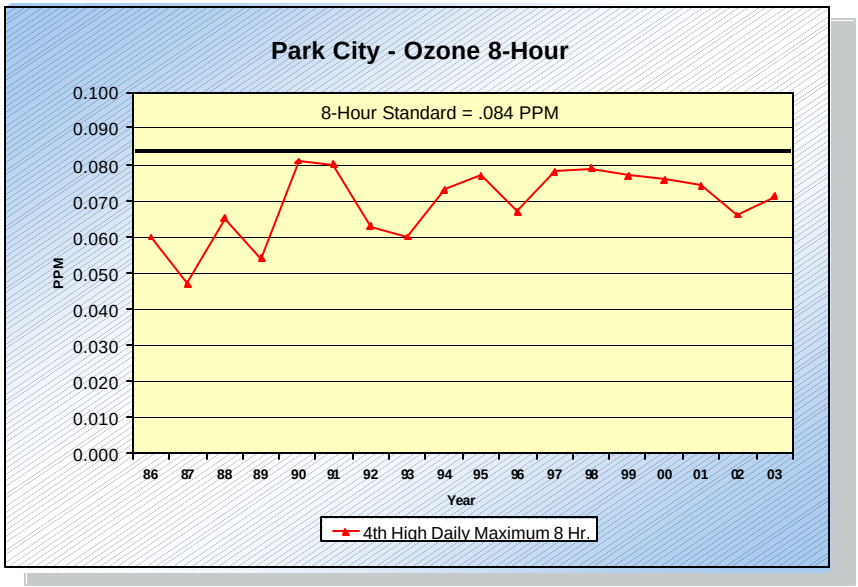
Map 3

Wichita Ozone

The Wichita-Sedgwick County area has experienced a moderate increase in monitored levels of ozone over the past decade. While the levels rarely approach the 1-hour ozone standard of .120 parts per million (ppm), the monitoring results are cause for concern when compared to the 8-hour ozone standard of .084 ppm. Graph 16 shows the ambient ozone monitoring trends for the monitoring site located at the Department of Environmental Health. Additional monitoring sites are located south of Wichita at Peck and north at Park City (Graph 17). The graph shows the ozone values expressed in the form of the standard used to determine an exceedance. The values are important in evaluating how the area is doing in regard to attainment of the National Ambient Air Quality Standard. The 8-hour values for the Wichita Department of Environmental Health monitor for the last three years show the Wichita area is remaining just under the 8-hour standard.



Graph 16



Graph 17

When EPA issued the 8-hour standard in July of 1997, local officials in Wichita-Sedgwick County recognized the need to take a proactive stance and agreed to participate in an EPA program known as the Voluntary Ozone Reduction Consortium. The goal of the program is for cities with ozone values close to the 8-hour standard to develop voluntary ozone reduction strategies. Successful implementation of the strategies would result in fewer cities exceeding the standard in the future. The public health, social and economic impacts of an ozone nonattainment designation for a city like Wichita would be severe. Such a designation would require development of a State Implementation Plan (SIP). The SIP would address issues such as: regulations to provide for emissions reductions from point sources; mobile source emissions reductions; improving the emissions inventory of all air pollution sources; and ensuring that the local transportation plan does not

What Can I Do?

Here's how you can help protect clean air in Kansas.

On the road.....

- Take the bus, walk or ride a bike.
- Carpool to work.
- Drive your newest car... It has better air pollution controls.
- Keep your engine tuned.
- Check your emissions control system.
- Have your gas cap pressure checked for leaks.

At Home.....

- Use a charcoal chimney instead of charcoal lighter fluid.
- Consider purchasing an electrical mower, or push mower if your lawn is small.
- If you use a gas mower, keep it tuned and wait until evening to mow your lawn.
- Use water-based paints rather than oil-based.
- Limit use of pesticides, paint thinners, solvents and petroleum products.
- Keep solvents and petroleum products tightly capped.

include projects that would jeopardize the area coming into compliance with the air quality standard. In addition to the serious public health consequences associated with exceeding the ozone standard are economic development concerns that flow from additional regulations that are implemented in any area designated nonattainment.

In 1999, local officials formed a work group of individuals representing industry, government, education and the public to address the ozone problem. Much of the first year was spent educating group participants about ozone formation, monitoring results, emissions inventories and potential ozone reduction strategies. In 2000, a report recommending ozone education and control strategies was prepared for submission to the governing body. In 2001 a contractor was selected to prepare an emissions inventory for area and mobile sources to better understand the sources of ozone precursors in the county and to develop a baseline against which reductions can be measured. The inventory was completed in 2002. The focus of the work group moved to developing a public education plan for the 2003 ozone season. The public education efforts currently underway inform citizens about the health effects of exposure to ozone, the role that individuals' daily activities play in ozone formation and actions they can take, such as car pooling, to reduce emissions of ozone precursors. During the 2004 ozone season, the Wichita Department of Environmental Health is conducting voluntary tailpipe emissions and gas cap tests. The events are a part of an Air Quality Awareness Program designed to educate citizens on how they can help Wichita keep it's air clean.

Kansas City Ozone

Based on air quality monitoring data collected by the Kansas and Missouri air monitoring programs, the Kansas City area was determined to be in violation of the national 1-hour ozone air quality standard in the 1970s. The federal Clean Air Act requires that if any area fails to attain the standard for any criteria pollutant, the respective state must develop and implement a State Implementation Plan (SIP). As a result of the violation, the State of Kansas developed and implemented an ozone SIP for the Kansas side of the Kansas City area, which included Johnson and Wyandotte counties. The State of Missouri developed a SIP for three Kansas City area counties on the Missouri side of the state line. Together, the two SIPs represented the strategies that would be employed to bring the area into compliance with the ozone standard.

In calendar years 1983 and 1984, the air monitoring data for the region revealed that violations of the ozone standard had again occurred. These violations required the states to make further revisions to the 1979 SIPs, implementing additional control measures to reduce volatile organic compound (VOC) emissions in the area. Efforts to redesignate the Kansas City area to attainment were halted when several exceedences of the 1-hour ozone standard were monitored during the summer of 1988. By the end of 1991, Kansas and Missouri had sufficient monitoring data below

What Can I Do?

Here's how you can help protect clean air in Kansas.

At The Service Station.....

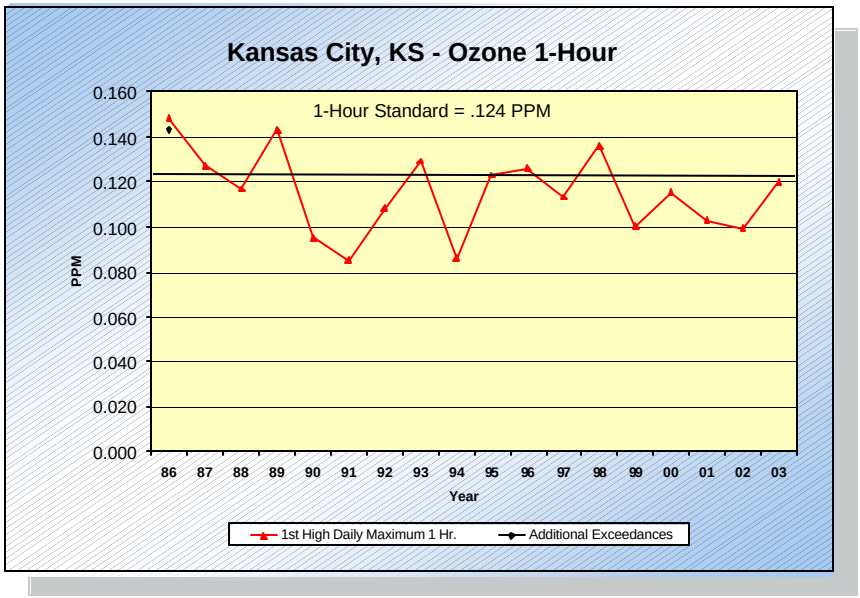
- Avoid spills to reduce gas fumes.
- Don't "top off" your gas tank.
- Tighten your car gas cap.
- Wait until evening to fill your car with gas.
- In summer, use plain water to clean your windshield.

At Play.....

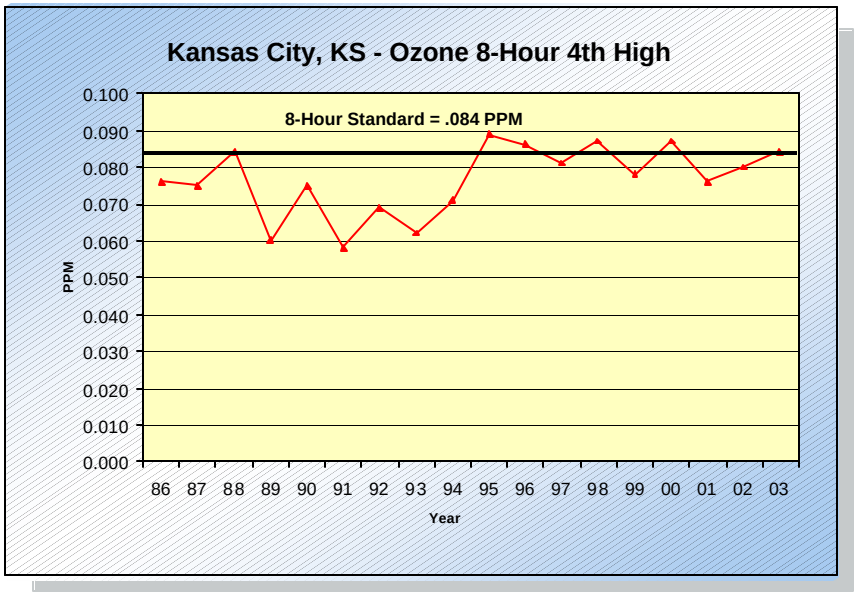
- Plan activities that don't require motors or gasoline. Hike, bike, skate, swim, canoe, sail, golf, or play tennis and team sports.
- Keep engines tuned in boats and other recreational vehicles.

the ozone standard to demonstrate that the area had attained the standard. Both states revised their respective SIPs for Kansas City to reflect that the area had met the standard. Graph number 18 shows 1-hour ozone monitoring results for the years 1986 through 2003.

Both states then worked to develop a Maintenance Plan, supporting the redesignation of the area to attainment and providing for additional measures to reduce emissions if violations of the ozone standard occurred in the future. In the summer of 1995, a long hot spell resulted in the Liberty, Missouri, monitor recording a violation of the ozone standard. The violation required the two states to implement additional control measures to reduce VOC emissions in the Kansas City area. Kansas adopted new rules requiring less evaporative gasoline in the summer months and the use of low vapor pressure solvent for cold metal cleaning operations.



Graph 18

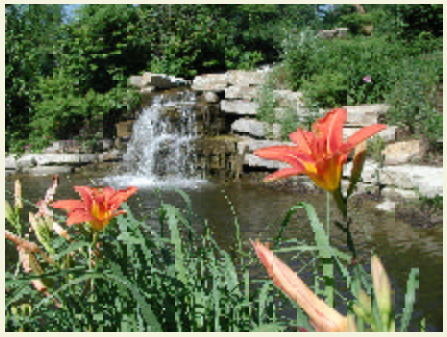


Graph 19

In July of 1997, EPA developed a more stringent 8-hour ozone national standard. The implementation of the new standard was delayed until after legal challenges were resolved. The first step in implementing the new 8-hour standard was to determine whether the Kansas City area met or violated the standard based on 2000-2002 monitoring results. These results showed the area in violation of the new standard. The Governor of Kansas therefore submitted a July 2003 letter to EPA recommending that the Kansas City area be designated as nonattainment. Monitoring data for the 2003 ozone season was not available when the Governor sent this letter. Graph number 18 shows 8-hour ozone monitoring results for the years 1986 through 2003.

A very unusual combination of factors caused the Kansas City area to record violations of the new 8-hour standard during April 2003,

demonstrating the impact that transport of pollutants can have on the area. In April, the annual burning of rangeland in the Flint Hills was compressed into fewer days than normal due to drought conditions. As a result, significantly more acres were burned per day than in normal years. This, coupled with unusual weather conditions for that time of year, caused emissions of VOCs and NOx from the fires to impact Kansas City and other points east of the Flint Hills. Ozone readings in excess of the standard occurred at monitors in Kansas City, Missouri, in the middle of April. Readings of that magnitude so early in the ozone season are unprecedented.



Photos by Susan Waters, City of Overland Park, and Brett C. Williamson, Johnson County, Kansas.

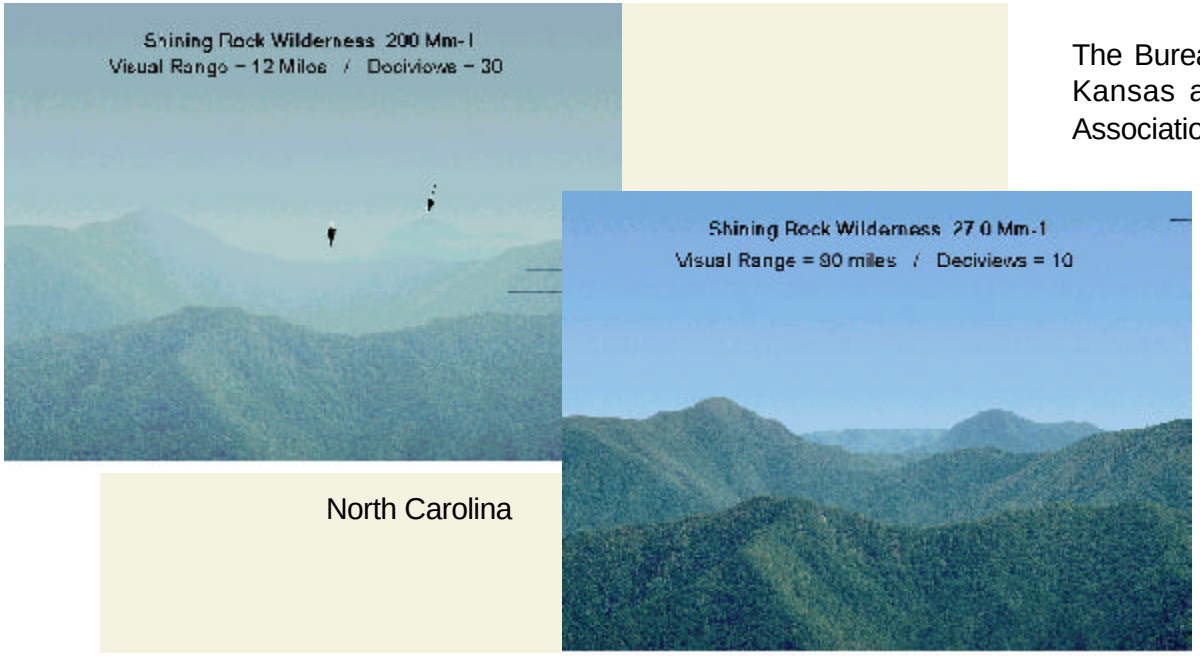
As a result of the unusual circumstances surrounding these high readings, the Missouri Department of Natural Resources requested that EPA flag the April 2003 data so that it would not be considered in determining whether the Kansas City area violated the new 8-hour ozone standard. EPA granted this request, effectively postponing a final decision on whether the area violates or attains the new standard. In April, 2004, EPA designated the area as "unclassifiable" pending review of the area's 2004 ozone monitoring data. It is still possible that the Kansas City area may be designated as nonattainment.

To address the ozone problem in a proactive manner, local government officials, industry representatives, state officials, and public interest groups are working together to develop a Clean Air Action Plan. The purpose of the plan is to educate stakeholders about the ozone issue, develop support for potential early strategies that could be implemented, and start the process of developing consensus on regulatory strategies that will end up in the SIPs that each state will prepare if Kansas City violates the standard.

Program Update

Web Submission of Emissions Inventories

The year 2003 also marked the beginning of development of the web-based submission of emissions inventories. The bureau is continuing to work with a contractor to create a program to allow Class I facilities to submit emissions inventory reports over the internet. The program would allow a facility representative to access the web site by entering a user i.d. and password, pull up the previous year's inventory submission, modify it to reflect any changes in facility operations through the last year and submit the revised information to the inventory staff for review. Current plans are for the program to create a summary page that would be mailed to BAR with any required fees. The Bureau will be working on electronic signature and payment procedures so the process would be completely paperless in the future.



North Carolina

Expansion of Ozone Monitoring Network

The year 2003 marked the completion of the expansion of the ozone monitoring network in the Kansas City area, and the posting of ozone data to the bureau web site. Three new monitors marked their first complete year of data collection. These include the Heritage Park monitor in southcentral Johnson County, the Leavenworth monitor near the federal penitentiary, and the Lawrence monitor located at the municipal airport north of Lawrence. Data from these and all other ozone monitors in Kansas can now be accessed at the bureau web site at www.kdhe.state.ks.us/bar/.

Regional Haze

The Bureau of Air and Radiation (BAR) represents the State of Kansas as a member of the Central Regional Air Planning Association (CENRAP). CENRAP is one of five regional planning organizations (RPOs) created to identify regional haze and visibility issues and develop strategies to address them. The association has been established in response to a Clean Air Act provision to reduce visibility impairment in areas such as National Parks and Wilderness Areas, referred to as Class I areas. Kansas is working jointly with neighboring states to provide for additional monitors; develop a shared emission inventory; and conduct modeling to identify strategies that will reduce regional haze. These will be incorporated into a State Implementation Plan (SIP) to be filed with the EPA in January of 2008. CENRAP also includes the States of

Louisiana, Arkansas, Texas, Oklahoma, Missouri, Iowa, Nebraska and Minnesota, together with Tribes with land in the boundaries of member states. Other stakeholders involved in the process include various industries, local and federal government agencies and public and international interests.

A number of projects have been recently initiated by CENRAP. These include long-term visibility monitoring for fine particulate matter at sites in the region, and a one-year ammonia monitoring project. Kansas has a visibility monitor at Cedar Bluff State Park and a second at the Tall Grass Prairie Preserve in the Flint Hills region of Kansas. The Sac and Fox Nation of Missouri in Kansas and Nebraska is operating a monitor on tribal land in northeast Kansas near the Nebraska border. The data from these and other sites will be used to establish baseline haze levels, to monitor progress and to validate computer models used to predict pollutant levels.

CENRAP also has a contract to perform a “causes of haze” assessment to determine how haze forms within the CENRAP region and how it may affect CENRAP Class I areas and those in neighboring RPOs. Members of CENRAP are also in the process of developing comprehensive lists of sources in the region eligible for application of best available retrofit technology (BART) to reduce emissions which contribute to the development of regional haze. An emissions inventory for sources of ammonia has been completed, and an analysis of the impacts of fire on regional haze is in progress. A regional haze model selection process is currently underway to determine which photochemical model will be used to conduct the modeling efforts that will serve as the basis for the control strategies that will be included in the SIP. These projects are all designed to promote efforts to reduce haze and improve visibility across the central United States.

About the Bureau

The mission of KDHE's Bureau of Air and Radiation is to protect the public health and environment from all types of air pollution.

Air Construction/Operating Permits and Compliance Section (ACOPCS)

The ACOPCS processes construction permit applications for emissions sources to ensure that they minimize the release of air contaminants and meet all regulatory requirements. Construction permits may be required for new construction, reconstruction or adding on to an existing facility. The Section staff review the applications to determine which state and federal regulations apply to the source. These are then included in the construction permit. The Section also processes operating permit applications for facilities that require operating permits under Title V of the 1990 amendments to the Federal Clean Air Act and determines compliance with state and federal air quality laws. Section staff determine all applicable air quality requirements for a facility and then incorporate all provisions into one operating permit for the facility. The Unified Government Health Department assists in the permitting process by issuing construction and operating permits in Wyandotte County.

A combination of education, technical assistance and enforcement actions are used by the Section staff to ensure facilities subject to the air quality regulations comply with applicable requirements. Staff from KDHE's district offices and the four cooperating local agencies conduct inspections and forward the results to the compliance section for review and response. When a source violates an air quality requirement, the staff takes formal enforcement action and works with the facility to assist the facility to return to regulatory compliance.

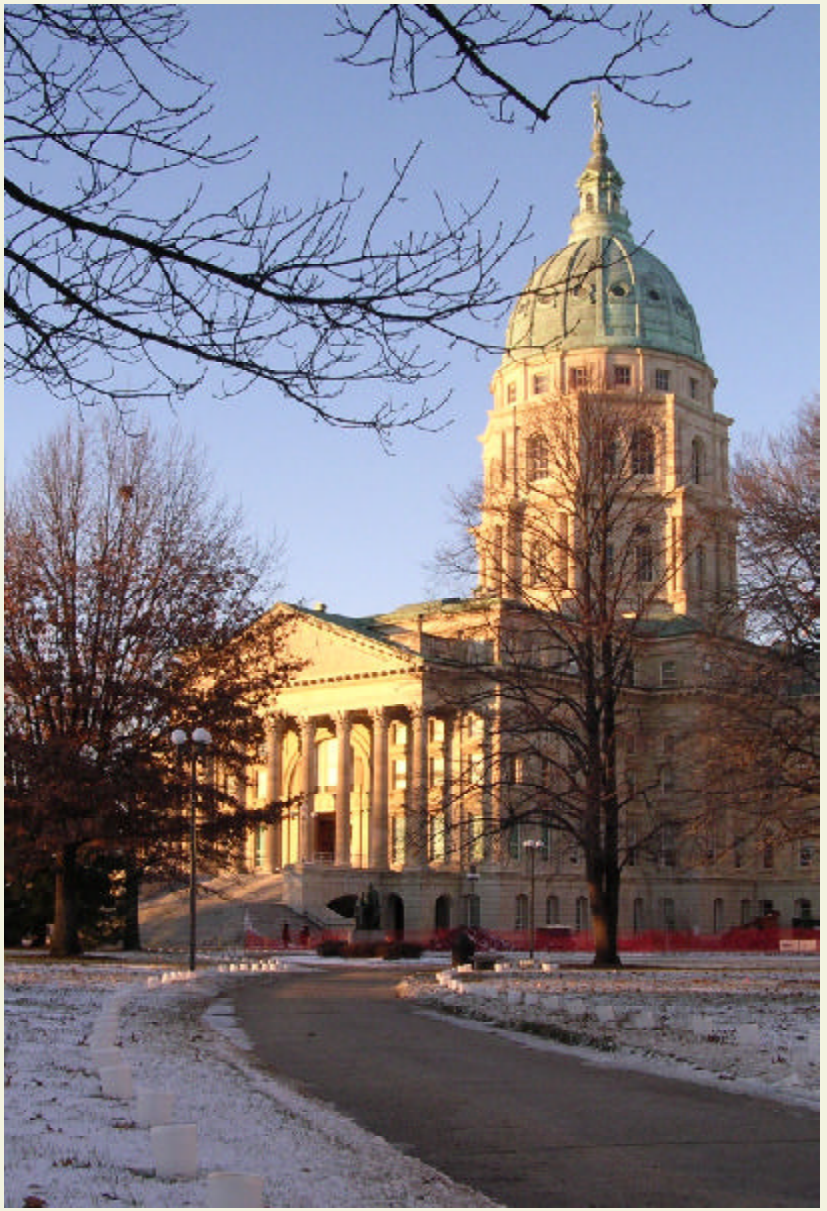
Monitoring and Planning Section

The Air Monitoring and Planning Section gathers information through monitoring, emission inventory and modeling programs which

provide a scientific and technical basis for the regulatory and administrative decisions of the Bureau. Section staff work with three local agencies to operate an air monitoring network that provides air quality data from **26** sites around the state. The data are analyzed to determine compliance with federal standards and to evaluate air quality trends. Staff members also conduct an annual emissions inventory of pollutants emitted from permitted facilities and other sources for the entire state. The emission inventory data is utilized by modeling staff to conduct air quality modeling to better understand the causes of air pollution and develop pollution control strategies in areas such as the Kansas City metropolitan area. These strategies are incorporated into State Implementation Plans and other planning documents to ensure that the program is implementing regulations and strategies that will protect the public health and environment from the negative effects of air pollution.

Radiation and Asbestos Control Section

The Radiation and Asbestos Control Section protects the public and the environment from the harmful effects of manmade radiation, natural radiation and asbestos. The Section staff manage the environmental radiation surveillance program to detect, identify and measure any radioactive material released to the environment resulting from the operation of Wolf Creek Generating Station in Coffey County. The Section staff also administers the radioactive materials and X-Ray control programs which regulates the use of ionizing radiation in Kansas. The asbestos program staff in this section monitor the removal of asbestos from building renovation and demolition projects and issues licenses to asbestos workers to ensure trained personnel conduct removal activities. Finally, the Right-to-Know program staff receives information regarding chemical storage and releases and makes such information available to the public.



Glossary

Air Quality Standards: The level of selected pollutants set by law that may not be exceeded in outside air. Used to determine the amount of pollutants that may be emitted by industry.

Ambient air: That portion of the atmosphere near ground level and external to buildings or other structures. Outdoor air quality is generally evaluated by measuring pollutant levels in ambient air.

Attainment Area: An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

AQS: Air Quality System, USEPA's database which serves as the national repository for ambient air quality monitoring data.

CAA - Clean Air Act (including all of its amendments): Originally passed in 1963; the current national air pollution control program is based on the 1970 version of the law. Substantial revisions were made by the 1990 Clean Air Act Amendments.

Class I area: National wilderness areas and national memorial parks larger than 5,000 acres, national parks over 6,000 acres, and international parks. Any such area must have been in existence on August 7, 1977, the date the Clean Air Act Amendments of 1977 were signed into law, to be considered a mandatory Class I area. Under the Clean Air Act, a Class I area is one in which visibility is protected more stringently than under the national ambient air quality standards; includes national parks, wilderness areas, monuments, and other areas of special national and cultural significance.

Citeria pollutant(s): The 1970 amendments to the Clean Air Act required EPA to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. The term is derived from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

Hazardous Air Pollutants (HAPs): Air pollutants which are not covered by ambient air quality standards but which, as defined in the Clean Air Act, may present a threat of adverse human health effects or adverse environmental effects. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides, and vinyl chloride.

IMPROVE - Interagency Monitoring of Protected Visual Environments: A collaborative monitoring program established in 1987 to provide data needed to assess the impacts of new emission

sources, identify existing man-made visibility impairment, and assess progress toward the national visibility goals that define protection of the 156 Class I areas.

Inversion: An atmospheric condition caused by increasing temperature with elevation, resulting in a layer of warm air preventing the rise of cooler air trapped beneath. This condition prevents the rise of pollutants that might otherwise be dispersed. Trapping pollutants near the ground increases ozone to harmful levels.

National Ambient Air Quality Standards (NAAQS):
Standards set by the U.S. Environmental Protection Agency (EPA) that limit the amount of six air pollutants allowed in outside air. These six, known as criteria pollutants, are carbon monoxide, inhalable particles, lead, nitrogen dioxide, ozone and sulfur dioxide. The limits are based on what is considered safe for humans to breathe.

Nonattainment area: A region in which air monitors detect more of a pollutant than is allowed by the National Ambient Air Quality Standards set by the U.S. EPA. The U.S. EPA may designate a region as a "nonattainment area" for that pollutant.

Ozone Violation: One-Hour Standard - Four or more exceedances of the federal ozone standard occurring in a three-year period at the same monitoring site. **Eight-Hour Standard** - Average (over the most recent three years) of the annual fourth highest daily maximum 8-hour average ozone concentration is greater than 0.08 ppm.

PSD - Prevention of Significant Deterioration: A program established by the Clean Air Act (CAA) that limits the amount of additional air pollution that is allowed in Class I and Class II areas. This program requires State and/or Federal permits to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standards.

Reformulated Gasoline (RFG): A fuel blend designed to reduce air toxins and volatile organic compound (VOC) emissions by decreasing the amount of toxic compounds such as benzene, lowering the evaporation rate and increasing the amount of oxygenate blended with the fuel.

Smog: Dust, smoke, or chemical fumes that pollute the air and make hazy, unhealthy conditions (literally, the word is a blend of smoke and fog). Automobile, truck, bus, and other vehicle exhausts and particulate matter are usually trapped close to the ground, obscuring visibility and contributing to a number of respiratory problems.

State Implementation Plan (SIP): A plan submitted by a state or local agency to the Environmental Protection Agency for complying with national air quality standards.

Agencies

United States Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101
www.epa.gov/region7

Johnson County Environmental Department
Pollution Control Division
Southlake Tech. Center Building #4
11180 Thompson Avenue
Lenexa, Kansas 66219
www.sharetheair.com

Mid-America Regional Council (MARC)
600 Broadway, 300 Rivergate Center
Kansas City, MO 64105
www.marc.org

Shawnee County Health Agency
1615 West 8th Street
Topeka, Kansas 66606
www.co.shawnee.ks.us

Unified Govt. of Wyandotte County-KC, Kansas
Department of Air Quality
619 Ann
Kansas City, Kansas 66101
www.wycokck.org

Wichita Dept. of Environmental Health
1900 East 9th Street
Wichita, Kansas 67214
www.wichita.gov/CityOffices/Health/Environmental/AirQuality

Kansas Dept. of Health and Environment
Division of Environment
Bureau of Air and Radiation
1000 SW Jackson, Suite 310
Topeka, Kansas 66612-1366
www.kdhe.state.ks.us/bar

KDHE-Bureau of Air and Radiation Contacts:

Administration: Clark Duffy, Director	785-296-6024
Asbestos/Right to Know:	785-296-1689
Compliance:	785-296-1544
Construction Permits:	785-296-1583
Emissions Inventory:	785-296-0451
Modeling:	785-296-6429
Monitoring Data:	785-296-1575
Monitoring:	785-291-3272
Operating Permits:	785-296-1561
Radiation:	785-296-1565

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